

CLAIMS

What is claimed is:

1. A compression conveyor auger assembly, for transporting and compressing waxed corrugated cardboard segments, comprising:

- 5 (a) a housing, said housing including an inlet end and an outlet end, wherein said outlet end is tapered;
- (b) an opening on said housing, said opening disposed adjacent said inlet end of said housing; and
- 10 (c) a compression conveyor screw rotatably disposed within said housing, said compression conveyor screw including a helical blade extending between said inlet end and said outlet end of said housing, said helical blade including a plurality of flights;
- 15 (d) wherein said helical blade includes a diameter that decreases towards said outlet end of said housing and wherein said flights decrease in length toward said outlet end of said housing.

2. An apparatus as recited in claim 1, further comprising a log die attached to said outlet end of said housing.

20 3. An apparatus as recited in claim 2, wherein said log die comprises at least one groove therein.

4. An apparatus as recited in claim 2, capable of producing a firelog that includes at least one longitudinally-disposed rail thereon.

5. An apparatus as recited in claim 1, wherein said housing comprises a circular passageway therein, said circular passageway including rifling.

6. An apparatus as recited in claim 1, wherein the cardboard segments being transported therethrough are compressed to a ratio of approximately between 5:1 to 8:1.

7. An apparatus as recited in claim 1, further comprising means for rotating said compression conveyor screw.

8. An apparatus as recited in claim 7, wherein said conveyor screw rotating means comprises a spur gear.

9. A waxed corrugated cardboard cutting assembly, comprising

(a) a plurality of lower circular blades juxtaposed along a first common axis, said plurality of lower circular blades each including a first cutting edge;

(b) a plurality of upper circular blades juxtaposed along a second common axis; said plurality of upper circular blades each including a second cutting edge;

(c) said plurality of lower and upper circular blades configured to slice the cardboard sheet placed therebetween into cardboard strips, whereby said first common axis is parallel to said second common axis, and said first cutting edge overlaps said second cutting edge; and

5 (d) a cutting reel positioned to receive the cardboard strips, said cutting reel capable of cutting the cardboard strips into cardboard segments.

10 10. An apparatus as recited in claim 9, wherein each said cutting edges of said lower circular blades and upper circular blades comprises a plurality of non-fluted teeth.

15 11. An apparatus as recited in claim 9, wherein said first common axis and said second common axis comprise a first shaft and a second shaft, respectively, whereupon rotation of said first shaft causes rotation of said lower circular blades and rotation of said second shaft causes rotation of said upper circular blades.

12. An apparatus as recited in claim 11, further comprising means for rotating said first and said second shafts.

20 13. An apparatus as recited in claim 12, wherein said first and said second shaft rotating means comprises spur gears.

14. An apparatus as recited in claim 9, further comprising means for rotating
said cutting reel.

15. An apparatus as recited in claim 14, wherein said cutting reel rotating
5 means comprises a spur gear.

16. An apparatus as recited in claim 9, further comprising:

(a) an lower guide plate disposed adjacent said second cutting edges of said
lower circular blades, said lower guide plate including a plurality of slots
10 through which said first cutting edges of said lower circular blades extend
through; and

(b) an upper guide plate disposed adjacent said second cutting edges of said
upper circular blades, said upper guide plate including a plurality of slots
15 through which said second cutting edges of said upper circular blades
extend through;

(c) wherein said lower guide plate and said upper guide plate define a
channel therebetween for receiving the cardboard sheets.

17. An apparatus as recited in claim 9, wherein said cutting reel comprises:

20 (a) a first and a second end plate;

(b) an axial shaft positioned perpendicularly between said first and said
second end plate; and

- (c) a plurality of cutting blades disposed around said axial shaft, said cutting blades spaced equally apart and generally parallel to said axial shaft; said cutting blades attached to said first and said second end plate;
- (d) wherein each said cutting blade includes a helical twist extending between said first and said second end plate.

18. A firestarter chip manufactured using a cutting assembly recited in claim 9, comprising:

- (a) a first substantially planar member;
- (b) a second substantially planar member;
- (c) a corrugated section disposed between said first substantially planar member and said second substantially planar member; and
- (d) means for adhering said corrugated section to said first substantially planar member and said second substantially planar member.

19. A method for manufacturing firestarter chips using a cutting assembly recited in claim 9, comprising the steps of:

- (a) slicing a waxed corrugated cardboard sheet into cardboard strips;
- (b) slicing at least one sheet of paper into paper strips simultaneous to said slicing said waxed corrugated cardboard sheet step; and
- (c) chopping said cardboard strips and said paper strips into waxed corrugated cardboard segments and paper segments, respectively.

20. A method for manufacturing firestarter chips as recited in claim 19, further comprising the steps of:

- (a) gathering said waxed corrugated cardboard segments and said paper segments; and
- (b) packaging said waxed corrugated cardboard segments and said paper segments.

21. An artificial firelog manufacturing apparatus, comprising:

- (a) an enclosure;
- (b) means for converting waxed corrugated cardboard into waxed corrugated cardboard segments, said converting means located within said enclosure;
- (c) a housing within said enclosure, said housing including an inlet end and an outlet end, wherein said outlet end is tapered;
- (d) an opening on said housing, said opening disposed adjacent said inlet end of said housing; and
- (e) a compression conveyor screw rotatably disposed within said housing, said conveyor screw including a helical blade extending between said inlet end and said outlet end of said housing, said helical blade including a plurality of flights;
- (f) wherein said helical blade includes a diameter that decreases towards

said outlet end of said housing and wherein said flights decrease in length toward said outlet end of said housing.

22. An apparatus as recited in claim 21, further comprising a hopper disposed within said enclosure, said hopper in communication with said opening of said housing and said cardboard sheet converting means.

23. An apparatus as recited in claim 21, wherein said cardboard converting means comprises:

- (a) a plurality of lower circular blades juxtaposed along a first common axis, said plurality of lower circular blades each including a first cutting edge;
- (b) a plurality of upper circular blades juxtaposed along a second common axis; said plurality of upper circular blades each including a second cutting edge;
- (c) said plurality of lower and upper circular blades configured to slice the waxed corrugated cardboard placed therebetween into waxed corrugated cardboard strips, whereby said first common axis is parallel to said second common axis, and said first cutting edge overlaps said second cutting edge; and
- (d) a cutting reel positioned to receive the waxed corrugated cardboard strips, said cutting reel capable of chopping the cardboard strips into waxed corrugated cardboard segments.

24. An apparatus as recited in claim 23, wherein each said cutting edges of said lower circular blades and said upper circular blades comprises a plurality of non-fluted teeth.

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25. An apparatus as recited in claim 23, wherein said first common axis and said second common axis comprise a first shaft and a second shaft, respectively, whereupon rotation of said first shaft causes rotation of said lower circular blades and rotation of said second shaft causes rotation of said upper circular blades.

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26. An apparatus as recited in claim 23, wherein said upper circular blades are adjustable axially.

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27. An apparatus as recited in claim 23, further comprising means for rotating said first and said second shafts.

28. An apparatus as recited in claim 27, wherein said rotating means for said first and second shafts comprise spur gears.

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29. An apparatus as recited in claim 23, further comprising means for rotating said cutting reel.

30. An apparatus as recited in claim 29, wherein said cutting reel rotating means comprises a spur gear.

31. An apparatus as recited in claim 23, further comprising:

- 5 (a) an lower guide plate disposed adjacent said second cutting edges of said lower circular blades, said lower guide plate including a plurality of slots through which said first cutting edges of said lower circular blades extend through; and
- 10 (b) an upper guide plate disposed adjacent said second cutting edges of said upper circular blades, said upper guide plate including a plurality of slots through which said second cutting edges of said upper circular blades extend through;
- 15 (c) wherein said lower guide plate and said upper guide plate define a channel therebetween for receiving the cardboard sheets.

32. An apparatus as recited in claim 23, wherein said cutting reel comprises:

- 20 (a) a first and a second end plate;
- (b) an axial shaft positioned perpendicularly between said first and said second end plate; and
- (c) a plurality of cutting blades disposed around said axial shaft, said cutting blades spaced equally apart and generally parallel to said axial shaft; said cutting blades attached to said first and said second end plate;

(d) wherein each said cutting blade includes a helical twist extending between said first and said second end plate.

33. An apparatus as recited in claim 21, further comprising a log die attached
5 to said outlet end of said housing.

34. An apparatus as recited in claim 33, wherein said log die comprises at least one groove therein.

10 35. An apparatus as recited in claim 34, capable of producing a firelog that includes at least one longitudinally-disposed rail thereon.

36. An apparatus as recited in claim 33, wherein said log die comprises at least one rail therein.

15 37. An apparatus as recited in claim 21, wherein said housing comprises a circular passageway therein, said circular passageway including rifling.

20 38. An apparatus as recited in claim 21, wherein the cardboard segments being transported therethrough are compressed to a ratio of approximately between 5:1 to 8:1.

39. An apparatus as recited in claim 21, further comprising means for rotating
said compression conveyor screw.

40. An apparatus as recited in claim 39, wherein said compression conveyor
5 screw rotating means comprises a spur gear.

41. A method for manufacturing an artificial firelog using an apparatus recited
in claim 21, comprising the steps of:

- (a) cutting waxed corrugated cardboard sheets into segments;
- (b) compressing said waxed corrugated cardboard segments to a ratio
10 approximately between 5:1 and 8:1;
- (c) extruding said compressed waxed corrugated cardboard segments into a
continuous log structure; and
- (d) cutting said continuous log structure into individual firelogs.

42. A method as recited in claim 41, wherein said step of cutting waxed
corrugated cardboard sheets into segments comprises the steps of:

- (a) slicing said waxed corrugated cardboard sheets into waxed corrugated
cardboard strips; and
- 20 (b) chopping said waxed corrugated cardboard strips into waxed corrugated
cardboard segments.

43. A method as recited in claim 42, wherein said step of slicing said waxed corrugated cardboard sheets creates opposing frayed edges on said waxed corrugated cardboard strips.

5 44. A method as recited in claim 41, wherein said step of compressing said waxed corrugated cardboard segments is performed with a compression auger conveyor assembly.

10 45. A method as recited in claim 41, wherein said step of extruding said waxed corrugated cardboard segments is performed with a log die.

15 46. An artificial firelog manufactured by an apparatus as recited in claim 21, comprising a plurality of waxed compressed corrugated cardboard segments packed together.

47. An artificial firelog manufactured by an apparatus as recited in claim 21, wherein said waxed compressed corrugated cardboard segments include opposing frayed edges.